

THE GENUS *HYPOPHYLLA* BOISDUVAL, 1836 (RIODINIDAE)
WITH DESCRIPTIONS OF NEW TAXA

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ABSTRACT. The genus *Hypophylla* Boisduval, 1836 is reinstated as the genus of a monophyletic group of riodinid butterflies previously included in the genus *Calospila* Geyer, 1832. Two new species, *Hypophylla caldensis*, **n. sp.** and *Hypophylla idae*, **n. sp.** are described from Colombia. Additional taxa included in the genus *Hypophylla* are *H. zeurippa* Boisduval, 1836; *H. lasthenes* (Hewitson, 1870), **reinst. stat., n. comb.**; *H. flora* (Staudinger, 1887), **n. comb.**; *H. martia* (Godman, 1903), **n. comb.**; *H. sudias* (Hewitson, [1858]), **n. comb.**; *H. sudias callaghani* (Constantino and Salazar), 1998, **n. comb., n. stat.**; and *H. argenissa* (Stoll, [1790]) **n. comb.** Notes are provided on the habitats, distribution, behavior, systematics of individual species, as well as keys for the determination of both males and females.

Additional key words: Trans-Andean region, México, Guatemala, Honduras, Nicaragua, Costa Rica, Panamá, Colombia, perching behavior, morphology.

Over the many years in which I have been studying the riodinids of the inter-Andean valleys and western coastal regions of Colombia, I collected a number of specimens of the genus *Calospila*, two of which I recognized as being undescribed taxa. My interest thus having been aroused, I examined other similar species of the genus *Calospila*. My conclusion was that these taxa form a distinct monophyletic group that belongs to the genus *Hypophylla* Boisduval. The purpose of this review is to 1) re-describe the genus *Hypophylla* Boisduval, 2) present morphological and biological information on each species comprising the genus and near relatives, 3) describe two new species in the genus, and 4) provide a key to the identification of both males and females.

MATERIALS AND METHODS

During course of the study I examined material at the Museo de la Universidad de Caldas, Manizales, Colombia, the Musée National d'Histoire Natural, Paris (MNHN), the Universidad Nacional Autónoma de México (MZFC), the collections of Dr. Schmidt-Mumm, Bogotá, and Dr. Francisco Delgado of Santiago, Veraguas, Panamá (FD) and of myself (CJC). I studied the relevant type material at the British Museum (Natural History), and the Humboldt Universität, Berlin. I examined 167 specimens and made 46 genitalia preparations. Measurements were made with an ocular micrometer and calipers. Reference to wing cells and veins follows the Comstock-Needham system in Miller (1969) and the genitalia terminology is from Klots (1970). My field trips in Colombia, Costa Rica and Panamá over a 25 year period provided data on the habitats and adult habits of *Hypophylla*.

HYPOPHYLLA Boisduval, 1836, **reinstated genus**

Type species. *Hypophylla zeurippa* Boisduval, 1836

Description. Male (Figs 26, 27)—Average Fw length = 16.5 mm. Forewing costa slightly curved to apex, apex slightly falcate, distal

margin slightly convex; hindwing with costa straight, distal margin rounded. Venation (Fig. 6), forewing with 4 radial veins, R1 and R2 branching before, and R3 after the discal cell, and Cu1 branching before. On the hindwing Rs branches before and Cu1 at the end of the discal cell, Vein 3A extends to the tornus. Dorsal surface wing ground color reddish-brown. Forewing costal margin dark brown to apex, wing dull purple from middle of cell to apex and to tornus, rest of wing reddish-brown; a reddish-brown line at end of discal cell and two more inside with two additional black lines in cell Cu2-1A+2A below; an irregular median band of connected reddish-brown spots reaches from the costa to Cu1, then is displaced basad such that it is closer to the cell, reaching 1A+2A; a submarginal black band extends from the apex to the inner margin, widest from costa to M3; fringe black. Hindwing reddish-brown above 1A+2A and anal margin light grey, and distal margin from tornus to Cu1 dark yellow-orange, fringe black. Some specimens have variable blue scaling at apex. Maculation includes a black spot on the costa, with a black line at end and two within the discal cell, and two more below in cell Cu2-1A+2A, median band of unconnected spots, one on costa slightly offset basad from next 4 in a straight row to Cu1, then two more offset basad to 1A+2A. Long hair-like scales are scattered in cell Cu2-2A. Ventral surface ground color dark grey-brown with black markings. Forewing with black markings as on dorsal surface. Hindwing pattern same as dorsal surface, but with a faint submarginal band reaching from apex to tornus, distad of which is a row of faint spots between the veins, those at the apex and tornus with more extensive variable black scaling.

Head, thorax, abdomen dark reddish-brown dorsad, uniform white scaling ventrad, antennae brown, ventrad with white scales between sections, club weak; orbit white, frontoclypeus white ventrad, with light brown scaling above; labial palpi (Fig. 1) dark brown, with short, dense scaling, last segment 0.32 of second, protruding beyond face when viewed dorsally. Forelegs (Fig. 3) white, with coxa thin and wedge-shaped, trochanter branching off slightly more than half way to the tip, tarsus unimerous; middle (Fig. 4) and hind legs with a tibial spur and a group of 3 spines on distal tip of tarsal segments.

Genitalia (Fig. 8)—Uncus deeply bifurcated and lobes rounded; vinculum narrow, widening medially, broad at base, connected to wide, spade-like saccus; valvae as two caudad projecting rounded processes, connected with a broad transtilla which has two long, thin caudad projecting processes, the right side (looking cephalad) longer; pedicel squared caudad; bifurcated process on transtilla short, reaching slightly beyond the end of the aedeagus; aedeagus pointed with one cornuti; posterior edge of 8th sternite slightly bifurcated.

Female (Figs. 28, 29)—Average forewing length 15.5 mm. Forewing height to length 1:1.44. Dorsal surface wing ground color light brown with ventral maculation appearing through. Forewing with 3.0 mm wide uneven pale yellow band reaching from costa almost to tornus, enclosing a variable spot of brown scaling at anal angle, band slightly jagged at end of cell. Ventral surface forewing apical area dark brown, bordered basad by pale yellow area

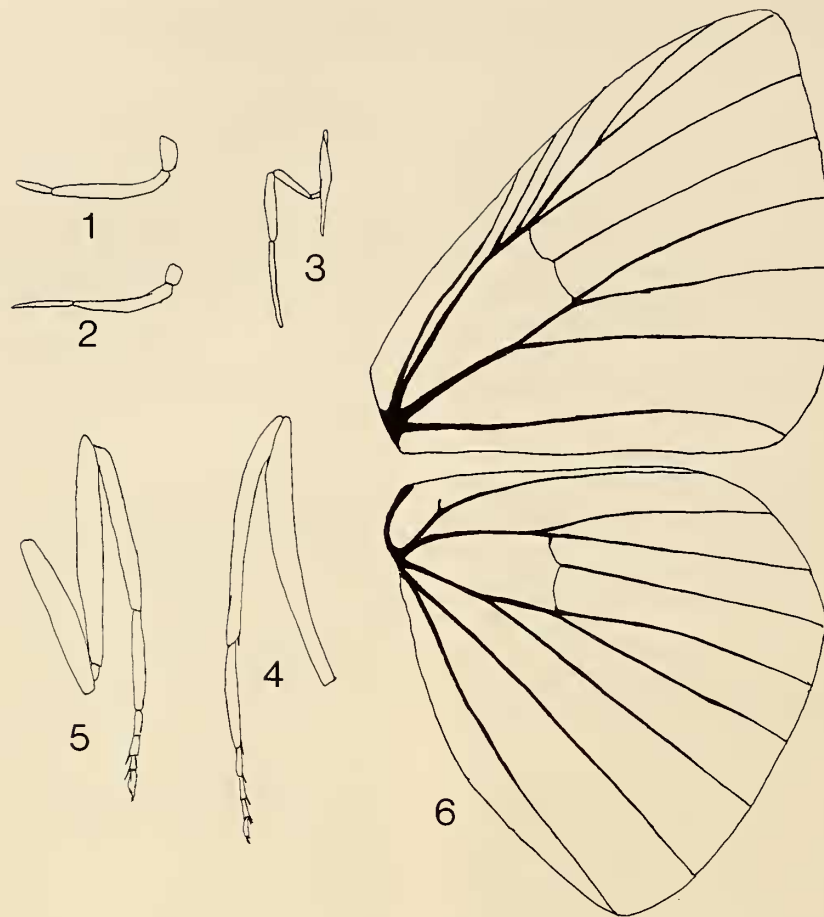


Fig. 1. Male palpi. Fig. 2. Female palpi. Fig. 3. Male foreleg. Fig. 4. Male middle leg. Fig. 5. Female foreleg. Fig. 6. Venation of *Hypophylla*.

corresponding to dorsal band, which extends along costa to base and stops slightly short of tornus. Submedian to base lighter grey-brown with brown maculation corresponding to that of male. Hindwing grey-brown, darker on submarginal area with same maculation as male.

Head, thorax and abdomen dark brown dorsad, white scaling ventrad; frons white basad, labial palpi (Fig. 2) dimorphic, longer than male, third segment 0.62 of second. Forelegs (Fig. 2) normal.

Genitalia (Fig. 18)—Papillae anales blade-like, rounded, setose, with a small point between lobes; ostium bursae opening as a wide funnel with the top folded dorsad and a small sclerotized ridge, ductus seminalis joins at the left side of the base, looking ventrad; corpus bursae with the signa as two slightly invaginated sclerotized patches.

Systematics: Most of the species proposed for the genus *Hypophylla* were originally described in the genus *Lemonias*. In his revision of that genus, Stichel (1911) resurrected the genus *Polystichtis* (Hubner 1816) for these and other butterflies, with the genus type being *Lemonias parthaon* (Dalman 1823). As the name *Polystichtis* was invalid as a subjective junior synonym of *Emesis* Fabricius, 1807, Hemming (1967) placed these butterflies under the next available name, *Calospila* Geyer, 1832.

As defined by Stichel, the genus *Calospila* includes at least two morphologically distinct groups; a section of species related to *C. parthaon*, the type of *Calospila* (including *C. gygas* (Stichel 1911) and *C. zeanger* (Stoll 1790)), and part of another section called the Argenissiforms by Stichel (1911), containing the species in this study. *Hypophylla* is related to *Calospila*, with which it shares vena-

tion (which probably led Stichel to include both under *Polystichtis*), sexually dimorphic labial palpi, and the slightly indented eighth abdominal sternite in the male.

Morphological synapomorphies which support the monophyly of *Hypophylla* are 1) the long, thin asymmetric posterior projecting processes of the transtilla of the male genitalia, 2) the branching of the ductus seminalis from the left side of the base of the ductus bursae of the female genitalia, 3) the formation of the opening of the ostium bursae which is folded over as a thin short membrane and with a variable internal flange, and 4) the signa in the corpus bursae as two slightly invaginated round sclerotized patches in all but one species.

In addition to the foregoing, the members of *Hypophylla* can be separated from those of *Calospila* by the general structure of the ostium bursae (compare Figs. 17 and 18), the separation of the male valvae and the male pedicel which is uniform and not inflated at the base (compare Figs. 7 and 8). Superficially, members of *Hypophylla* may be recognized by their generally larger size, dull blue coloration on the male dorsal forewing and orange-yellow at the tornus and submarginal areas of the hindwing.

Among the Stichel's Argenissiforms, there are two that do not belong. *Calospila candace* H. Druce (1904), from southeast Brazil, is a typical *Calospila*, as I verified through examination of the male and female genitalia. The other is *Calospila fannia* (Godman 1903), which is likewise a *Calospila*. (J. Hall, pers. comm.).

The male, and, especially female, genitalia show consistent phenotypic variation and are a good basis for the separation of species.

Important characters in the male include the shape of the uncus, shape of the valvae and caudad projecting process on the transtilla, shape of the pedicel, rami and the adeagus. In females, important characters include the shape of the ostium bursae, position of the ductus seminalis and the signa in the corpus bursae.

With the changes and new species proposed in this review, the following synonymic list summarizes the classification of *Hypophylla*:

HYPOPHYLLA Boisduval, 1836
zeurippa zeurippa Boisduval, 1836,
eumedes Doubleday, 1847, nom. nud.
lasthenes (Hewitson, 1870), **reinst. stat., n. comb.**
martia (Godman, 1903), **n. comb.**
caldensis Callaghan, **n. species**
flora (Staudinger, 1887), **n. comb.**
idea Callaghan, **n. species**
sudias sudias (Hewitson, [1858]), **n. comb.**
sudias callaghani (Constantino and Salazar), 1998, **n. comb., n. stat.**
argenissa (Stoll, [1790]), **n. comb.**
petronius (Fabricius, 1793)
staudingeri (Godman, 1903)

ECOLOGY AND BEHAVIOR

Distribution and habitat. Members of *Hypophylla* exclusively inhabit the transandean region, from México (Chihuahua, Guerrero, Chiapas, Oaxaca, Veracruz) through Central America to Colombia (Cordillera Oriental, west slope to the Pacific coast) and western Ecuador. The genus is not recorded from the eastern (Amazonian) slope of the Cordillera Oriental. It shows its greatest radiation in Colombia, with six species recorded. Four species are found in Costa Rica (DeVries 1997) and southern Nicaragua, while two are found in Mexico, and one in Ecuador (J. Hall, pers. comm.). The assertion in Seitz (1917) that it is found in Venezuela needs verification. In the MNHN in Paris there is a typical *H. lasthenes* male from "Surinam", which I suspect is a mislabelling.

The majority of the species inhabit tropical lowland Tropical Humid Forest and Very Wet Humid forests (Holdridge 1947) below 900 m. Two species in Colombia are found in Premontane Humid Forest zone in the Coffee belt, between 900 and 1800 m.

Wing pattern and predation. The males of all species but one have bright yellow patches on the distal hindwing to attract predators to that part of their anatomy, as suggested by captured specimens with beak-bite marks on the hindwing. Females mimic day flying moths with a yellow band on the forewing, particularly Geometridae (Laurentiinae, Sterrhinae) and Arctiidae (Lithosiinae) (DeVries 1997; pers. obs.)

Mating behavior. All species of *Hypophylla* use perching as mate locating behavior. Perch localities as well as male behavior differ among species. The males of six taxa perch inside woods edges, streams or treefalls, resting with outspread wings on ventral leaf surfaces, and three, *H. caldensis*, *H. sudias callaghani*

and *H. idae* I found exclusively on hilltops, resting on the dorsal leaf surfaces (Fig. 52). When disturbed, all species fly with a rapid, loping flight similar to *Eurybia*, or a satyrid, returning shortly to their original perches. When not perching, both sexes rest under leaves with the wings flat.

SPECIES ACCOUNTS

Hypophylla zeurippa Boisduval, 1836 (Figs. 26, 27, 28, 29)

eumedes Doubleday, 1847, nom. nud.

Hypophylla zeurippa was described from a male from Mexico and as the type of the genus *Hypophylla*. Boisduval's type was discovered in the British Museum (Natural History) by Dr. Gerardo Lamas. The specimen is similar to the *H. zeurippa* population from the Pacific coast (Guerrero), which is distinct from the southern and gulf coast populations.

Diagnosis. The similarity of the male genitalia place *H. zeurippa* in a group comprising *H. martia*, *H. lasthenes* and *H. caldensis*. In fact, I initially considered these four to be conspecific. However, the distinct female genitalia and consistently different wing patterns and coloration, and lack of intergrades, as well as *H. lasthenes* and *H. martia* being sympatric in Costa Rica and Panamá, convinced me otherwise. The males of *H. zeurippa* are easily distinguished by the dark orange color of the uniform submarginal band on the hind wing (in some individuals it may be entirely lacking) coupled with the weak markings on the ventral surface. The females have a narrow yellow subapical band on the forewing, a characteristic shared with *H. martia*; however they may be separated by the post median row of spots between Rs and Cu1 ventral hindwing being in a straight line. *H. zeurippa* male specimens from Guerrero have more extensive blue on the forewing, and a wider yellow forewing band on the females.

Range. *Hypophylla zeurippa* ranges from Mexico (Colima, Guerrero, Veracruz) south through Guatemala, Honduras, Belize to central Nicaragua(?).

Material examined. MÉXICO: 1 ♂ Santa Marta, Oaxaca, 500 m, 1 June 1970 (CJC); 8 ♂♂ 1 ♀ Candelaria, Loxiche, Oaxaca, 500 m, 10 Aug., (CJC); 2 ♂♂ same locality, Aug. Oct. 1988 (MZFC); 2 ♂♂ Chacalapilla, Candelaria, Loxiche, Oaxaca, 24 July 1990, (MZFC); 10 ♂♂, 7 ♀♀ Las Parotas, Atoyac de Alvarez, Guerrero, 25 Oct. 1985; 11 Sept. 1988, 20 Jan. 1987, 25 Nov. 1985, 4 May 1985, 25 Oct. 1985, 11 Sept. 1985, (MZFC); 8 ♂♂, 8 ♀♀ Río Santiago, Atoyac de Alvarez, Guerrero, 20 March 1987, 10 Sept. 1985, 6 July 1985, 23 Oct. 1985, 9 July 1985, 26 Nov. 1985, 22 July 1984, 23 Oct. 1985, 28 July 1984, 25 July 1984, 5 May 1985, 8 Aug. 1985, (MZFC); 1 ♂ Camino a Tonina, Ocosingo, Chiapas, 14 July 1991, (MZFC); 1 ♀ Ojo de Agua, Madrid, Tecoman, Colima, 29 Oct. 1982 (MZFC); Baden de Neixpa, Lazaro Cadenas, Michoacan, 15 Feb. 1996, (MZFC); 1 ♂ Metates San Miguel Aloapam, Oaxaca, Aug. 1991, (MZFC); GUATEMALA: 1 ♂ Guatemala, (MNHN).

Hypophylla lasthenes (Hewitson, 1870) (Figs. 30, 31, 32, 33)

Hewitson described *Lemonias lasthenes* from a male from Chontales, Nicaragua. Godman and Salvin (1886) extended its range to Costa Rica and Panamá, and Stichel (1911) placed this taxon as a subspecies of *Polystichtis zeurippa*. Some confusion exists regarding the type. The specimen in the British Museum (Natural History) bearing the type label from "Chontales" is typical of southern Mexican specimens of *H. zeurippa*. Comparison of this specimen with the original description suggests that it is not the type, especially with reference to the size of the orange spot on the dorsal hindwing. It is possible that both phenotypes occurred at Chontales, but is impossible to verify as forest habitat there no longer exists.

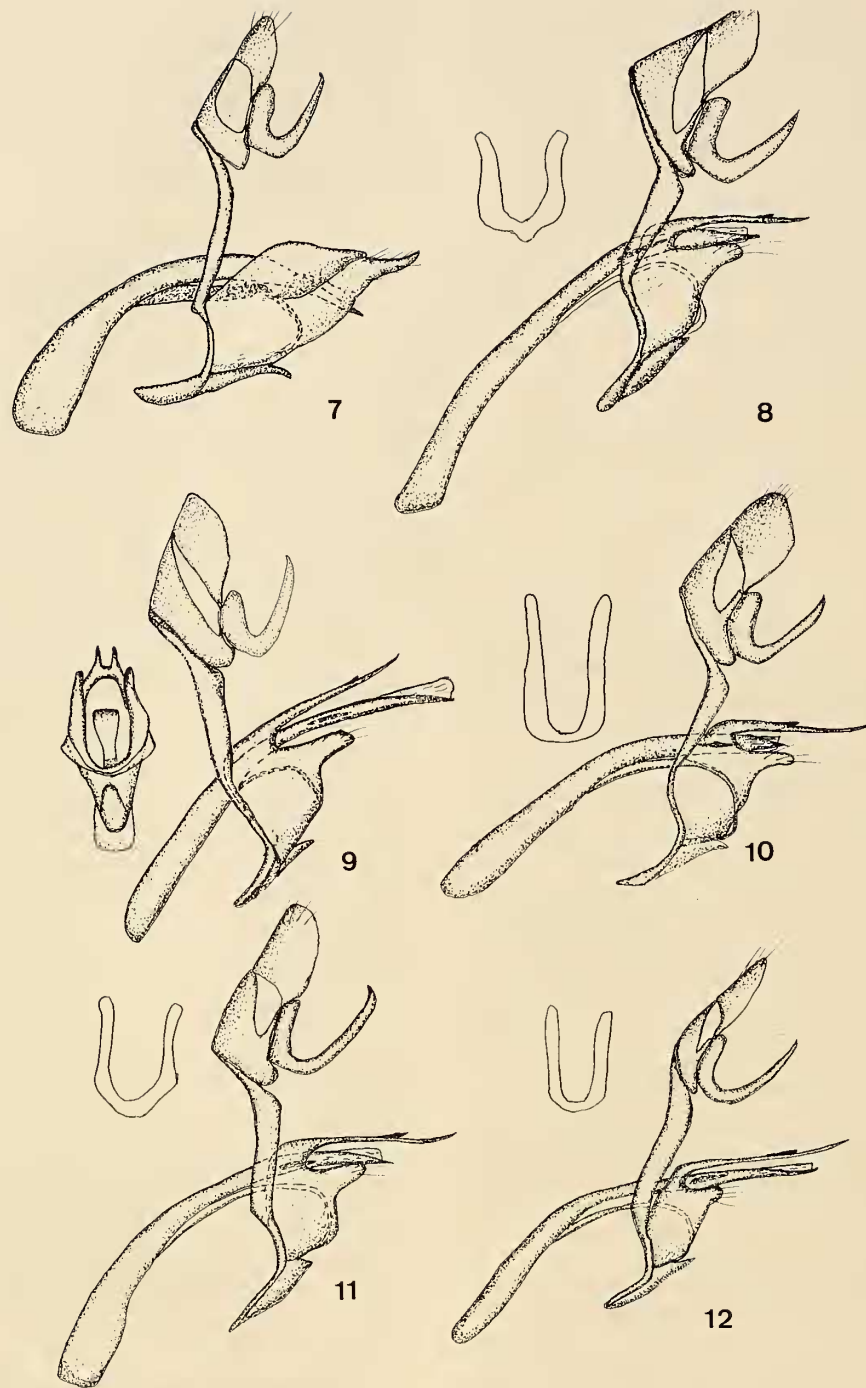


FIG. 7. *Calospila parthaon*, male genitalia. FIG. 8. *Hypophylla zeurippa*, male genitalia. FIG. 9. *Hypophylla lasthenes*, male genitalia. FIG. 10. *Hypophylla martia*, male genitalia. FIG. 11. *Hypophylla caldensis*, male genitalia. FIG. 12. *Hypophylla flora*, male genitalia.

Diagnosis. A comparison of *H. zeurippa* and *H. lasthenes* suggests that they are separate species. Their populations are apparently allopatric with no intergrades, the male genitalia are similar, but *H. lasthenes* has more parallel and longer valvae (Fig. 9). The female genitalia of *H. lasthenes* (Fig. 19) have the ductus bursae more swollen and a sclerotized patch opposite the base of the ductus seminalis. Superficially, *H. lasthenes* males are separated from *H. zeurippa* and *H. martia* by the wider, more rounded and more

brightly colored orange patch on the hindwing that extends from M2 to the inner margin, with a wavy basal edge. The ground color is lighter, the maculation bolder on the ventral surface, and the females have a wider, more even forewing band.

Material examined. COSTA RICA: 1♂, 2♀♀ Chilamate, 100 m, Heredia, 30 June 1992, leg. Callaghan. (CJC); PANAMÁ: 1♂, 2♀♀ Colón, Puerto Bello, Rio Cuango, 26 April 1991, 1 Aug. 1991 leg. Delgado (FD); 2♂♂, 6♀♀ Colón, Coclesito, 50 m, 9 Sept. 1988,

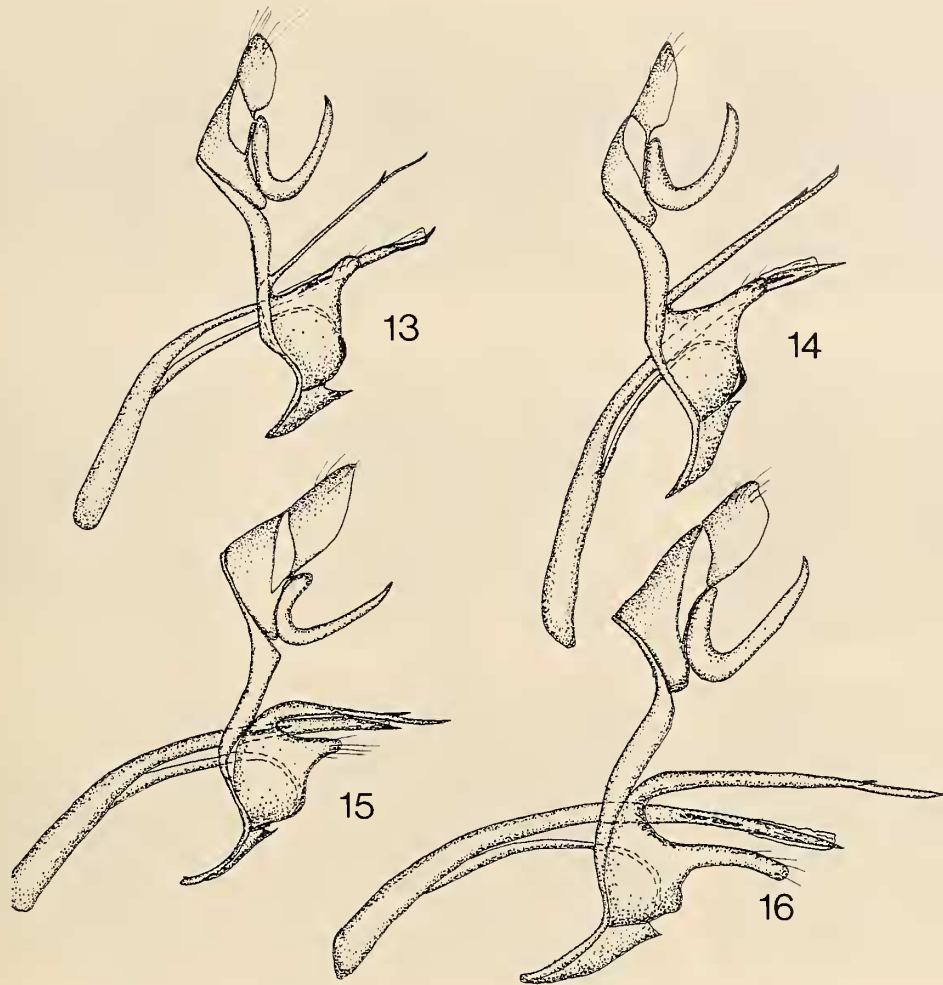


FIG. 13. *Hypophylla idae*, male genitalia. FIG. 14. *Hypophylla sudias callaghani*, male genitalia. FIG. 15. *Hypophylla sudias sudias*, male genitalia. FIG. 16. *Hypophylla argenissa*, male genitalia.

4 Sept. 1988, 13 Jan. 1989, 22 Feb. 1989, 18 March 1994, 16 June 1988, leg. Delgado (FD); 1♂ Santa Fé, Belém, 13 March 1987, leg. Delgado (FD); 1♀ Alto de Piedra, Santa Fé de Veraguas, 28 Sept. 1989, leg. Delgado, (FD); 1♂ "Surinam" (MNHN); 1♂ no data (MNHN); 1♀ Panamá, (MNHN); 1♀ Chiriquí, Panamá (MNHN).

Range and habits. This species is recorded only from northern Costa Rica to the Caribbean coast in Panamá. DeVries (1997) reports this phenotype from Costa Rica on both Atlantic and Pacific slopes near sea level in mangrove habitats. My experience with this butterfly in Costa Rica is in Very Humid Tropical Rainforest (Holdridge 1947) on the edge on a small hilltop near Chilamate, Heredia (100 m). Two females were captured at 1000 hours resting with wings outspread on the underside of leaves. At 1230, a male was taken on the same hilltop likewise resting under a leaf with wings spread. It is rare in Costa Rica, more common in Panamá.

Hypophylla martia (Godman, 1903), **n. comb.**
(Figs. 34, 35, 36, 37)

This species was described from a male originating from San Pablo on the Río San Juan, Chocó, Colombia. The type is in the British Museum (Natural History).

Diagnosis. *H. martia* males resemble *H. zeurippa* in the extent of blue on the forewing and the uniform dark orange submarginal band along the distal margin of the hindwing, reaching from the torus to M2. *H. martia* may be separated by the much darker maculation of both wing surfaces, generally thinner submarginal line on the forewing apex, and more pointed forewing. The male genitalia (Fig. 10) differ in the shorter, thinner valvae and a more truncated process on the transtilla. The female forewing band, while approximately the same width, is sharper on *H. martia*, is not bordered basad by the end of the discal cell and terminates on the distal margin. The ductus bursae (Fig. 20) is wider in *H. martia* and dilated at the base of the ductus seminalis.

Range and habits. This species ranges from Costa Rica to the west coast of Colombia. In Costa Rica, there is one record for this species from Magsaysay in the lowland Atlantic rainforest (DeVries 1997). This species is very rare in Colombia, the only specimen I have seen from there is the type. It appears to be more common in Panamá, where it is sympatric with *H. lasthenes*. From my data, the habitat of this species is lowland tropical rain forest.

Material examined. PANAMA: 1♂ Gamboa, 5 Jan. 1979, (CJC); 1♂ same locality, 16 Dec. 1979, (CJC); 1♂ Los Rios, 4 Jan. 1971, leg. King (CJC); 1♀ Barro Colorado Island, July 13, 1977, leg. R. Robbins (CJC); 1♂, 2♀♀ Chepo Island, Majé, March 1989 leg.

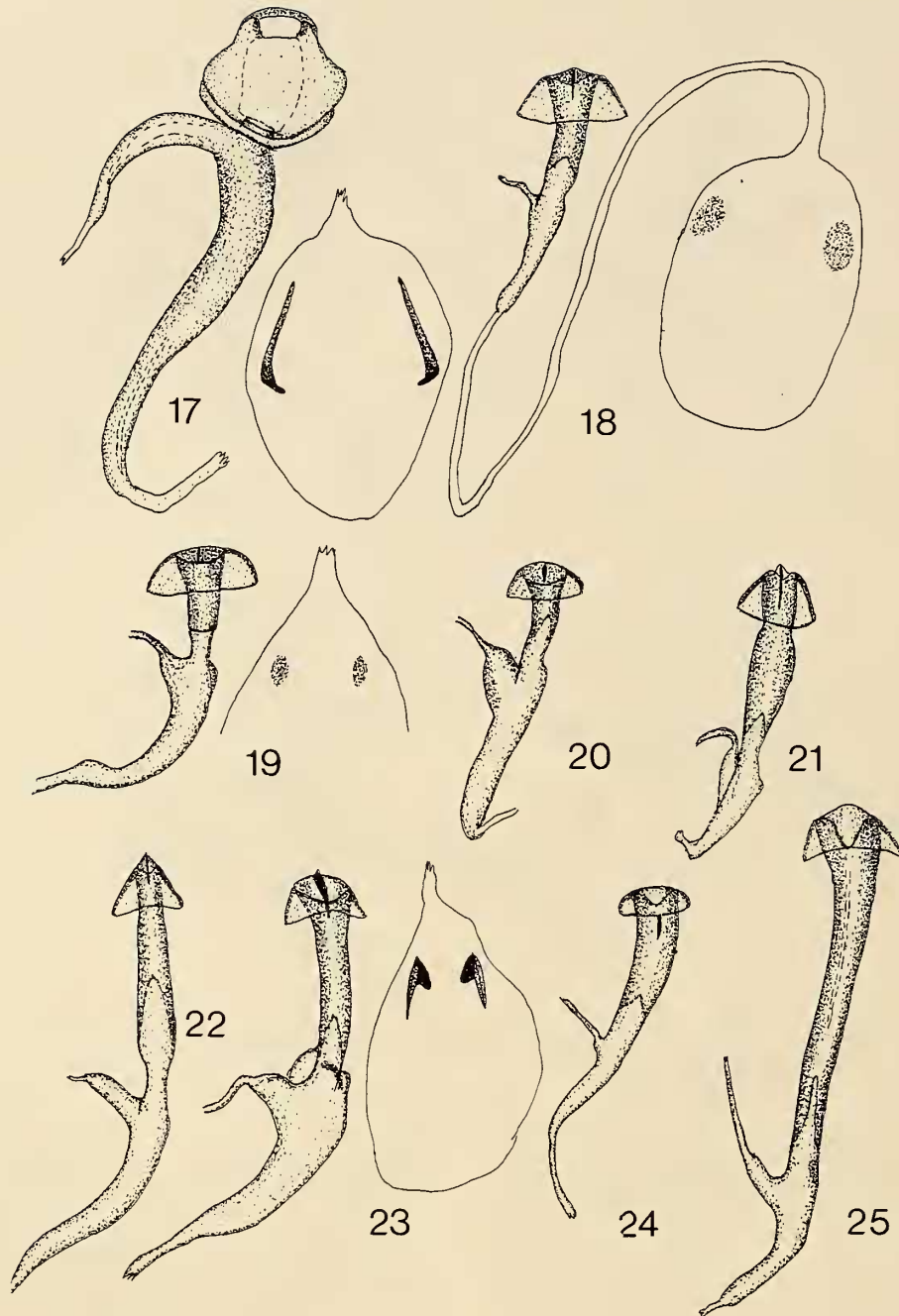


FIG. 17. *Calospila parthaon*, female genitalia. FIG. 18. *Hypophylla zeurippa*, female genitalia. FIG. 19. *Hypophylla lasthenes*, female genitalia. FIG. 20. *Hypophylla martia*, female genitalia. FIG. 21. *Hypophylla flora*, female genitalia. FIG. 22. *Hypophylla idae*, female genitalia. FIG. 23. *Hypophylla caldensis*, female genitalia. FIG. 24. *Hypophylla sudias*, female genitalia. FIG. 25. *Hypophylla argenissa*, female genitalia.

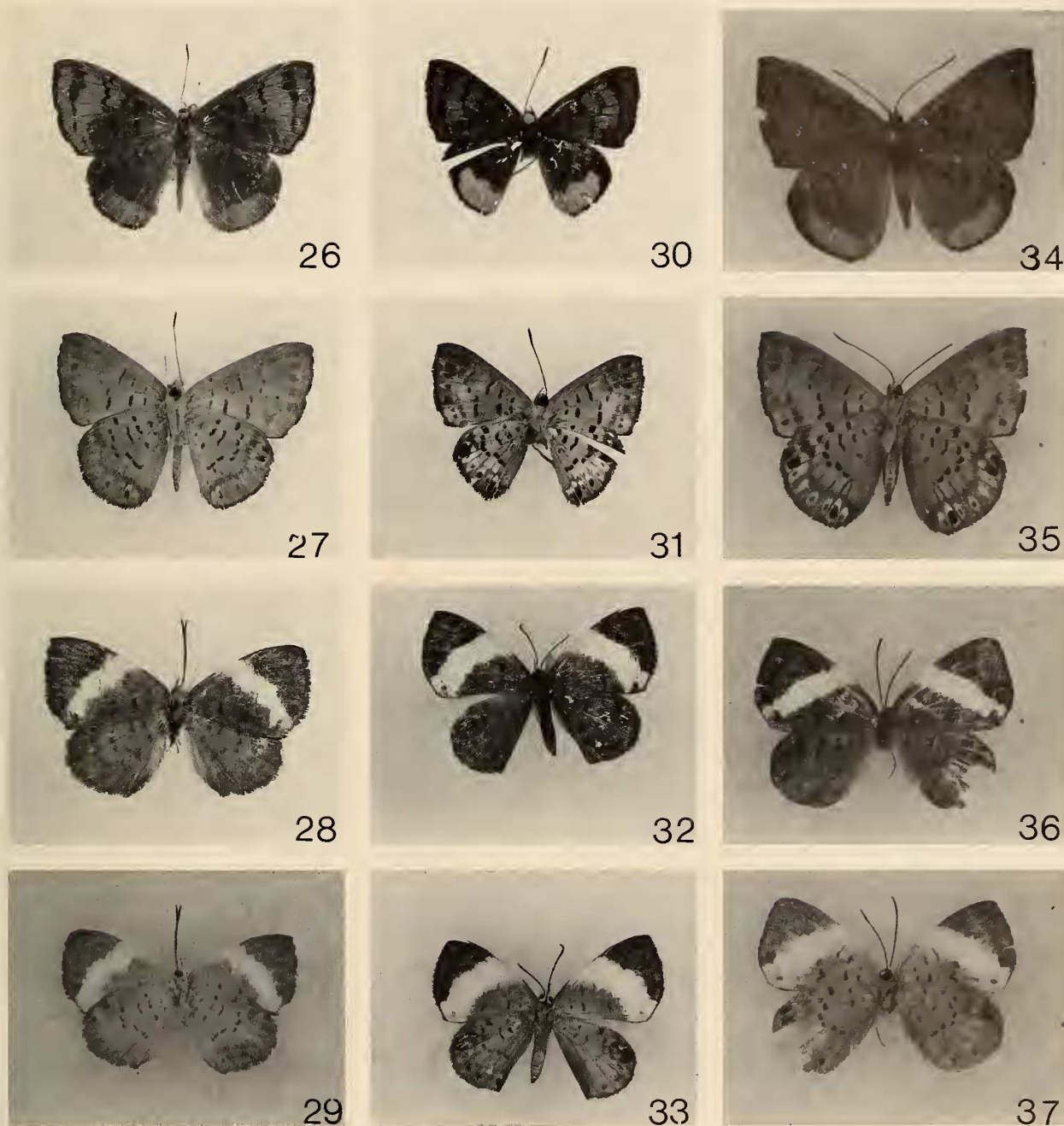
Delgado, (FD); 2♂♂, 3♀♀ Colón, Coclesito, 23 Jan. 1988, 15 April 1990, 26 Aug. 1988 leg. Delgado, (FD); 1♂, 2♀♀ Colón, Puerto Bello, Río Cuango, 26 April 1991, leg. Delgado (FD).

***Hypophylla caldensis* Callaghan, new sp.**

(Figs. 38, 39, 40, 41)

Description. Male (Figs. 38, 39)—Forewing length of Holotype 16.5 mm and paratypes 16.2 mm. Forewing costa slightly curved to apex, apex rounded, distal margin slightly convex; hindwing with

costa straight, distal margin rounded. Forewing costa dark brown to apex; dull, light purple from end of discal cell to apex and to tornus, rest of wing reddish-brown; a reddish-brown line at end of discal cell and two more inside, two additional black lines in cell Cu2-1A+2A below; a median band of connected dark brown spots reaches from the costa to Cu1, then is displaced basad such that it forms a continuous band with the end of the cell to 1A+2A; a marginal black band extends from the apex to the inner margin, widest from costa to M3; fringe black. Hindwing costa above M1 to apex dark brown with two black spots above discal cell and faint irregular blue spot just before



FIGS. 26, 27. *Hypophylla zeurippa*, male, dorsal/ventral view. FIGS. 28, 29. *Hypophylla zeurippa*, female, dorsal/ventral view. FIGS. 30, 31. *Hypophylla lasthenes*, male, dorsal/ventral view. FIGS. 32, 33. *Hypophylla lasthenes*, female, dorsal/ventral view. FIGS. 34, 35. *Hypophylla martia*, male, dorsal/ventral view. FIGS. 36, 37. *Hypophylla martia*, female, dorsal/ventral view.

apex, base to median above 1A+2A reddish brown and anal margin light grey, postmedial area and distal margins yellow-orange, fringe black. Discal cell includes a black line at end and two within, and two below in cell Cu2-1A+2A, median band of unconnected, bold spots, one on costa slightly offset distad from next 4 in a straight row to yellow-orange area. Ventral surface ground color dirty white with black markings. Forewing slightly darker at apex and margin, black markings as on dorsal surface. Hindwing maculation as on dorsal surface, and yellow-orange area same, but paler, with a darker marginal area containing a row of variable marginal black spots, those at

anal angle and two at apex larger; a post median row of spots continues below Cu1, offset basad and nearly parallel to those above.

Head, thorax, abdomen dark reddish-brown dorsad, uniform white scaling ventrad, antennae brown dorsad, with white scales ventrad between sections, club long, weak; orbit white, frontoclypeus white ventrad, with light brown scaling above; labial palpi scaled, protruding beyond face when viewed dorsally.

Genitalia (Fig. 10)—uncus bilobed and rounded, valvae rounded, narrower and straighter than *H. zeurippa*, process of transtilla slightly longer and thinner, posterior edge of 8th sternite slightly bi-

furcated, aedeagus pointed with unsclerotized sheath, and a wedge-shaped cornuti.

Female (Figs. 40, 41)—forewing length 15.5 mm. Dorsal wing ground color light brown with ventral maculation appearing through. Forewing with a 3 mm wide uneven pale yellow band from costa almost to tornus, enclosing a variable spot of brown scaling at anal angle, band slightly jagged at end of cell. Ventral forewing apical area dark brown, bordered basad by pale yellow area reflecting the dorsal band, base light grey with indistinct brown maculation corresponding to that of male. Hindwing light grey with dark brown apex and brown maculation as on male. Head, thorax and abdomen dark brown dorsad, white scaling ventrad; frons white basad, labial palpi sexually dimorphic, third segment longer than on male.

Genitalia (Fig. 23)—ostium bursae as a long, sclerotized tube, slightly wider at opening where the rim is folded dorsad, and with a high, sclerotized flange in the middle dorsad; base of tube very broad where the ductus seminalis separates; corpus bursae elongated with two well developed, invaginated, pointed signa.

Types. Holotype male COLOMBIA: Cerro Aguacatal, Río Súcio, 1600 m, Caldas 21 March 1997 leg. Callaghan. Paratypes. 3♂♂ same data as holotype, and 2♂♂ same locality, 30 April 1994 leg. J. Salazar (CJC), and 1♂ 12 km west of Otanché, Boyacá, 700 m (ex collection E. Schmidt-Mumm), and 1♂ Río Cali, Valle, 1100 m, 12 October, 1981 leg. Callaghan (CJC). 1♀ Aguas Claras 100 m, Río Anchicayá, 6 June 1982, leg. Callaghan, (CJC); 1♂ Cauca, 1000 m, (MNHN). The Holotype is deposited in the Museum of the Universidad Nacional, Bogotá, and paratypes in the author's collection and the NMNH, Washington, D.C.

Etymology. The species is named after the Department in Colombia where the type locality is located.

Diagnosis. The males of *H. caldensis* differ from *H. zeurippa* and *H. martia* in the greater extent and lighter yellow color of the distal half of the dorsal hindwing and the lighter ground color and darker maculation on the ventral surface, and from *H. lasthenes* by the expanded yellow on the hindwing. On the ventral forewing, the post median spots below Cu1 form a continuous line with the end of the discal cell. The ventral surface is less strongly marked than *H. lasthenes*. The genitalia are very close to *H. zeurippa* but with slightly shorter valvae.

A female captured at Aguas Claras (Tatabro) Chocó, 100 m is tentatively described as the female of this species. The unique morphology of the genitalia (Fig. 23), in particular the fully developed invaginated sclerotized signae instead of the sclerotized patch does not associate it with any other species. It shares certain characters with *H. caldensis* males, such as a spot on the tornus of the forewing and the beginning of the medial band in line with the end of the cell. However, the specimen was captured in a completely different biotope from the males that are not known from the Chocó. Therefore, until more material can be examined, the specimen will be maintained as the female of *H. caldensis*.

Range and habits. *H. caldensis* ranges from 700 to 1800 m in the Cauca and Magdalena river drainage of Colombia, and possibly to the Chocó. Its habitat is in the coffee zone characterized as Premontane very humid forest with rainfall between 2000 and 4000 mm. (Espial & Montenegro 1977). The species is probably more widespread than suggested by the few records known. Males perch on hilltops from 1300 to 1500, where they fly with a bouncing flight like a small satyrid, resting on leaf dorsal surfaces 1–2 meters above the ground (Fig. 52). The Río Cali specimen was found in the woods by the river at 1130.

Hypophylla flora (Staudinger, 1887), n. comb.

(Figs. 42, 43, 44, 45)

Lemonias flora was described from a male captured near the Rio San Juan, Chocó, in western Colombia. The type is in the Humboldt Museum, Berlin.

Diagnosis. The male of *H. flora* can be easily separated from its congeners by the shape of the orange-yellow spot on the distal half of the hindwing, which is rounded at the tornus and culminates in a point

at M1; ventral surface dark grey, markings indistinct, apex of ventral hindwing has three black triangular marks bordered basad with white between the veins. The male genitalia (Fig. 12) has an uncus similar to *H. zeurippa*, but the valvae are extremely truncated. The aedeagus extends far beyond end of valvae, and is same length as left process of the transtilla, only slightly shorter than the right one. The female has a 4 mm. wide yellow band reaching from the costa to the distal margin. The band of *H. idae* is likewise wide, but ends on the inner margin. In the female genitalia (Fig. 21), the ductus bursae is a narrow sclerotized tube, wider in the middle and slightly wider at the ostium bursae where the rim is folded dorsad, with a high dorsal sclerotized flange in the middle reaching above the rim. The ductus bursae is slightly broader where the ductus seminalis separates; the signa in the corpus bursae are two slightly invaginated sclerotized patches.

Range and habits. *Hypophylla flora* is known from the Chocó region on the Colombian west coast to western Ecuador (Tinalandia, Paramba, Palmar, in northwest Ecuador. J. Hall, pers. comm.), from sea level to 300 m. Seitz' (1917) assertion that it ranges to Venezuela was possibly based on mislabelled material. I have observed this species perching on the underside of leaves along forest trails and along streams in primary rainforest. It is rare.

Material examined. COLOMBIA: 4♂♂ Río Tatabro (Aguas Claras), Río Anchicayá, Valle, 100–200 m 11 Nov. 1989, leg. Callaghan (CJC); 1♀ Río Tatabro, Valle, July 1992, leg. Salazar (CJC); 2♂♂ Cauca, 1000 m (MNHN).

Hypophylla idae Callaghan, new species

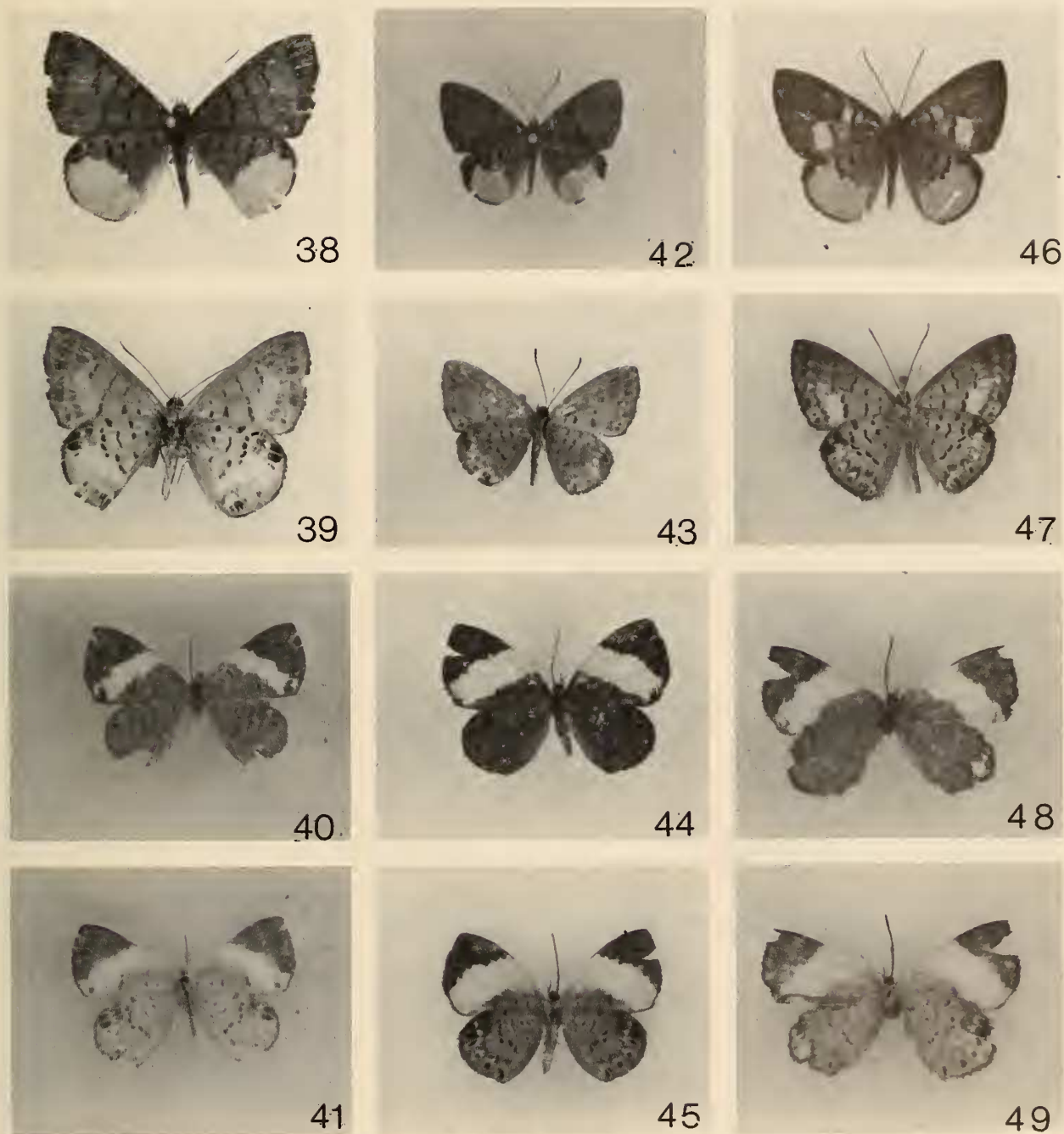
(Figs. 46, 47, 48, 49)

Description. Male (Figs 46, 47)—forewing length of holotype and paratypes 16.7 mm (N = 5). Forewing costa slightly curved to apex, apex pointed, distal margin slightly convex, hindwing with costa straight, distal margin rounded. Dorsal wing ground color reddish brown with dull purple and yellow-orange scaling. Forewing discal cell with orange scaling and black bars at end, middle and base, and two more cell Cu2–1A+2A below; costa and post medial area above M3 and distad of cell end to apex and to tornus dull purple, with a row of faint marginal spots; base to slightly beyond end of cell below M3 reddish-brown with some orange scaling distad, and bordered distad with a black bar; postmedian area between M3 and 1A+2A with a yellow-orange spot; below 1A+2A to base reddish-brown, fringe black. Hindwing base, discal area reddish-brown with black markings at end, middle and base of discal cell, two black spots on costal margin and a medial row of spots between RS and 1A+2A, the first four in a straight line, the last two offset basad; apex and fringe to tornus black, postmedial area to margin yellow-orange; fringe black. Ventral surface ground color dark grey, maculation as on dorsal surface, dorsal yellow-orange areas ventrally light pink. Forewing with marginal row of black spots between the veins bordered basad with white, that continues along the hindwing margin, the two spots at the apex being the largest.

Head, thorax and abdomen reddish-brown dorsad, mixed white-brown scaling ventrad, appendages white, antennae brown dorsad, ventrad with white scales between sections, club weak, orbit white, frontoclypeus brown; palpi scaled, protruding beyond face when viewed dorsally.

Genitalia (Fig. 13)—uncus deeply bifurcated, lobes squared; vinculum thin, slightly wider in middle; saccus rounded, valvae tips rounded, transtilla with two very long, thin processes, left slightly shorter than right; aedeagus long, pointed with tip turned up, and internal cornuti; pedicel rounded, posterior margin of 8th sternite slightly bifurcated.

Female (Figs. 48, 49)—forewing length 16.8 mm. Forewing elongated, height to length 1:1.52. Dorsal wing ground color light brown with ventral maculation appearing faintly. Forewing with 5 mm wide uniform yellow band from costa to just before tornus and inner angle, enclosing a tiny spot at tornus. Ventral forewing apical area dark brown with two rows of faint white marginal spots and bordered basad by pale yellow area corresponding to dorsal band, base light grey with indistinct brown maculation corresponding to that of male. Hindwing light grey with dark brown apex and brown maculation as on male.



FIGS. 38, 39. *Hypophylla caldensis*, Holotype male, dorsal/ventral view. FIGS. 40, 41. *Hypophylla caldensis*, female, dorsal/ventral view. FIGS. 42, 43. *Hypophylla flora*, male, dorsal/ventral view. FIGS. 44, 45. *Hypophylla flora*, female, dorsal/ventral view. FIGS. 46, 47. *Hypophylla idaii*, Holotype male, dorsal/ventral view. FIGS. 48, 49. *Hypophylla idae*, female, dorsal/ventral view.

Head, thorax and abdomen dark brown dorsad, white scaling ventrad; palpi sexually dimorphic, longer than male.

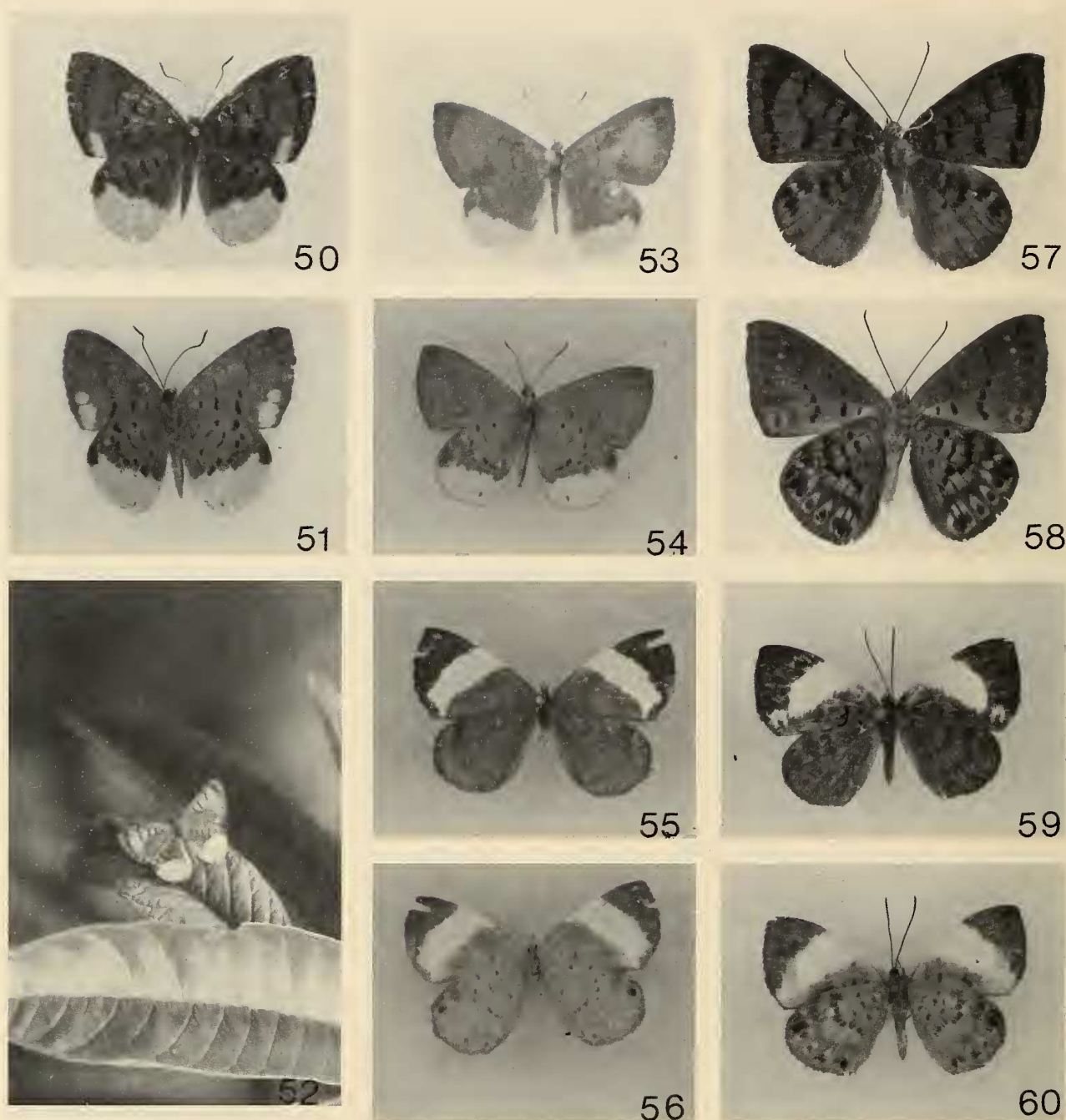
Genitalia (Fig. 22) – Ductus bursae as a narrow, long funnel, narrowing slightly at the pointed opening, with the top doubled over and a small internal sclerotized flange, ductus seminalis joining at the left side of base; the signa on the corpus bursae are represented by two very weakly sclerotized patches.

Types. Holotype male: COLOMBIA, Quebrada Valle Sol, km. 104, Bogotá-Medellin, Antioquia, leg. Keith S. Brown Jr. Paratypes. 1♀ with same data as holotype; 1♀ Río Calima (Calima Dam) 800 m,

Valle, 27 Oct. 1982, leg. C. Callaghan, (CJC); 2♂♂, 1♀ Río Claro 700 m, 5°50'N 74°52'W, Antioquia, Nov. 4, 1989, leg. Callaghan, (CJC); 1♂ Río Calderas, 700 m Cocoruá, Antioquia, Jan. 4, 1996, leg. Salazar, (CJC). The Holotype is deposited in the Museo de la Universidad Nacional, Bogotá, and paratypes are deposited in the author's collection and the NMNH, Washington DC, USA.

Etymology. This lovely species is named for my wife, whom I met near the type locality.

Diagnosis. Male *H. idae* are easily separated from its cogeners by the orange spot at the postmedian area of the forewing. The gen-



FIGS. 50, 51. *Hypophylla sudias callaghani*, male, dorsal/ventral view. FIG. 52. *Hypophylla caldensis* male perching on hilltop, Río Súcar, Caldas. FIGS. 53, 54. *Hypophylla sudias sudias*, male, dorsal/ventral view. FIGS. 55, 56. *Hypophylla sudias sudias*, female, dorsal/ventral view. FIGS. 57, 58. *Hypophylla argenissa*, male, dorsal/ventral view. FIGS. 59, 60. *Hypophylla argenissa*, female, dorsal/ventral view.

italia differs from *H. zeurippa* in the squared lobes of the uncus, longer, thinner process on the transtilla and rounded pedicel. The female differs in the elongated forewing and 5 mm broad forewing band that terminates mainly on the inner margin instead of the distal margin.

Range and habits. The type locality is a disturbed forest hilltop off the Medellín-Bogotá highway in the Central Cordillera. The vegetation is Pre-montane very humid forest and Very humid tropical forest (Espial & Montenegro 1977). All male specimens were ob-

served perching on hilltops between 1100 and 1200 on the upper surfaces of leaves with their wings slightly raised. The females were discovered in nearby woods.

Hypophylla sudias sudias (Hewitson, [1858]), **n. comb.**
(Figs. 53, 54, 55, 56)

Lemonias sudias was described from a male from Honduras. The holotype is located in the British Museum (Natural History).

Diagnosis. The males of *H. sudias* may be easily separated by the purple scaling covering the dorsal forewing to Cu2-1A+2A with the postmedian area of the hindwing yellow-orange reaching from M3 to the tornus with yellow fringe, and the slightly falcate apex of the forewing. The ventral surface ground color is grey-brown and the black markings are weak, not appearing above vein Cu1; the yellow band appears on the ventral surface and the fringe is yellow. Some specimens from the gulf coast of México (Popocatóptl, Vera Cruz) have some yellow scaling on the tornus of the dorsal forewing, similar to *H. s. callaghani* (see below). Specimens from Panamá differ in having a uniform marginal black band on the forewing and heavier markings on the ventral surface, intermediate to *H. s. callaghani*. In the male genitalia (Fig. 15), the uncus is deeply bifurcated and the lobes pointed; the valvae are only slightly shorter than *H. zeurippa* and the aedeagus is the same length as the right process of the transtilla. *H. sudias* females are distinguished by a 5 mm wide white band on the forewing which reaches from the costa nearly to the distal margin, then curves into the inner margin narrowing to a point. In the female genitalia (Fig. 24), the ductus bursae is a short, wide sclerotized tube, slightly wider at the ostium bursae opening where the rim is folded dorsad, with a deep V-shaped notch in the rim, the sclerotized flange in the dorsal middle is reduced, not reaching the rim. The ductus bursae is only slightly broader where the ductus seminalis separates; the signa in the corpus bursae are two barely sclerotized patches.

Range and habits. *H. sudias sudias* ranges from northern México (Chihuahua) down the Gulf Coast to Oaxaca and Chiapas, then south to Panamá, inhabiting lowland tropical forest. There is one record in the Allyn Museum of Entomology from San Quintin, BCN which needs verification. The species is known from Costa Rica from a single specimen (DeVries 1997). J. Hall (pers. comm.) reports *H. sudias* males at Lake Petén, Guatemala perching one meter high under leaves inside the forest edge at 1630.

Material examined. MÉXICO 1♂, 1♀ Chiapas, San Filipe, 3000", Pasta, 6 Aug. 1974. leg. R.Wind, (CJC); 1♂, 1♀ Monumento Natural Yachilán, Ocosingo, 5 Abr. 1998, Sept. 1948 (MZFC); 2♂♂, 3♀ Ocosingo, Chiapas, Sept. 1948, June 1940, (MZFC); 1♂ Sierra de Juárez, Oaxaca, July 1982, (MZFC); 1♂ San Juan Chamula Chiapas, 19 July 1993, (MZFC); 1♂ Cerro del Coconá, Teapa, Tabasco, 20 April 1995, (MZFC); Ojo de Agua, Michoacan, 17 Nov. 1981 (MZFC); 8♂, 2♀ Puerto eligio, Oaxaca, 6 Oct. 1986, 12 Aug. 1986, 6 Oct. 1986, 31 Oct. 1987, 11 May, 1980, 10 Aug. 1986 (MZFC); 4♂♂ 30 July 1982 (MZFC); 3♂, 8♀ Popocotépetl, San Andres Tuxtla, Veracruz, July 1982, 24 Sept. 1982, 9 July 1982, 20 Aug. 1982, (MZFC); 1♂, 1♀ Tapalapan, 5 Aug. 1982, (MZFC); 1♀ Santa Rosa Comitán, Chiapas, Oct. 1982 (MZFC); 3♀♀ Metates, San Miguel, Aloapam, Oaxaca, 16 Sept. 1987, 22 July 1979 (MZFC); GUATEMALA: 1♂ Las Cajas, El Petén, 250 m, (CJC); PANAMÁ. 1♀ Alto de Piedra, Santa Fé de Veraguas 840 m, 23 Feb. 1987 (FD).

Hypophylla sudias callaghani

(Constantino & Salazar, 1998), **n. comb., n. stat.**

(Figs. 50, 51)

The male of *H. sudias callaghani* was described from Tatabro, Río Anchicayá, 100 m, Chocó, Colombia, as a species, *Calospila callaghani*. The Holotype is deposited in the Museo de Historia Natural de la Universidad de Caldas, Manizales. Examination of the phenotype and the female suggests, however, that it is a subspecies of *H. sudias*.

Diagnosis. Males are easily distinguished from the nominate subspecies and other *Hypophylla* by the yellow-orange spot at the tornus of the forewing combined with the heavy maculation on both wing surfaces. The male genitalia (Fig. 14) of the two subspecies are slightly different, with the uncus of *H. sudias callaghani* more pointed, and the valvae and processes of the transtilla longer and

narrower. The female of *H. sudias callaghani* is illustrated in D'Abreu (1994) on page 1032 from a specimen in the BMNH from the Río San Juan, Chocó, misidentified as the female of *H. argenissa*. The females differ from the nominate subspecies in the slightly more truncated white band on the forewing, and appear to be very rare.

Range and habits. The habitat of this subspecies is coastal tropical rain forest in the Chocó region of western Colombia. Males can be encountered rarely on hilltops after 1530 where they fly in circles with a bouncing flight like a small satyrid, resting on leaf dorsal surfaces 2-3 meters above the ground.

Material examined. COLOMBIA: 1♂ Quebrada Bendición, Valle 7 July 1987 leg. Keith Brown Jr. (CJC); 2♂♂ Aguas Claras, Río Anchicayá, 100 m, 16 June 1982 leg. Callaghan (CJC); 1♂ Aguas Claras, Jan. 17, 1982, leg. Callaghan (CJC); 1♂ Quibdó, Chocó, June 17, 1993, leg. K.B. Brown Jr.

Note: The locality Aguas Claras is also known as Tatabro, located on the Río Anchicayá east of Buenaventura.

Hypophylla argenissa (Stoll, [1790]), **n. comb.**

(Figs. 57, 58, 59, 60)

=*petronius* (Fabricius, 1793) (Hesperia)
= *staudingeri* (Godman, 1903) (Lemonias)

Stoll described *Papilio argenissa* from material supposedly from Surinam. This may be in error, as to my knowledge this species has not been recorded east of the Cordillera Occidental in Colombia. This led Godman (1903) to describe *Lemonias staudingeri* from a misidentified figure based on a western Colombian specimen in Staudinger's Exotische Schmetterlinge, which was in fact *P. argenissa*. The type of *L. staudingeri* is in BMNH. I was unable to locate Stoll's type during my searches at the museum at Leiden, The Netherlands, so it is apparently lost. However, the distinct morphology of this butterfly precludes the necessity of designating a neotype.

Diagnosis. This species can be confused with no other. The ground color of the male dorsal surface is uniform dark blue with black markings. On the ventral surface, the ground color is dark brown with black markings and infusion of white scaling on the hindwing. In the male genitalia (Fig. 16) the uncus is bifurcated with a narrow notch and the lobes are pointed, the valvae are long and narrow, and the aedeagus contains two cornuti. The females are easily distinguished from other members of the genus by the yellow forewing band with a straight basal border and a distal border that is curved towards the tornus. In the female genitalia (Fig. 25) the ductus bursae is a long, narrow, funnel shaped, sclerotized tube, bulbous where the ductus seminalis separates and wider at the ostium bursae where the rim is folded dorsad, with a minuscule, sclerotized flange in the middle and a U-shaped notch; the signa in the corpus bursae are two elongated sclerotized patches.

Range and habits. *Hypophylla argenissa* ranges from Costa Rica to Colombia, where it inhabits west coast (Chocó) from sea level to about 300 m. In Panamá and Costa Rica, this species is found on both Pacific and Atlantic slopes to 1000 m (DeVries 1997, pers. obs.). Both sexes perch on hilltops, in treefalls and on forest edges from 1100 to 1500, resting on ventral leaf surfaces with wings outspread.

Material examined. COLOMBIA: 2♂♂ Aguas Claras, Río Anchicayá, Valle, 17 Jan. 1982, leg. Callaghan (CJC); 1♀ same locality, July 1990 leg. Salazar (CJC); 1♀ same locality, 1 Aug. 1981, leg. Callaghan (CJC); 1♀ same locality, May 24, 1982, leg. Callaghan (CJC); 2♂♂, 1♀ same locality, 20 Feb. 1982, leg. Callaghan (CJC); PANAMÁ: 1♀ Canal Zone, Gatún, 26 April 1989, leg. Callaghan (CJC); 1♂ Colón (Santa Rita) 500 m, 7 Jan. 1975, leg. Nicolay (CJC); 2♂♂ Gamboa, 17 May 1979 (CJC); 3♂♂, 1♀ Colón, Río Cuango, 25 Oct. 1992, 15 Febr. 1995, 20 Sept. 1991, leg. Delgado (FD); 9♂♂, 3♀♀ Colón, Coclesito, 18 June 1988, 27 Aug. 1988, 27 June 1986, 27 Nov. 1986, 11 Sept. 1988, 13 March 1989, 30 Nov. 1988, leg. Delgado (FD); 1♀ Alto de Piedra, Santa Fé de Veraguas, 10 Sept. 1981, leg. Delgado (FD). COSTA RICA: 1♂, 2♀ Chilamate, Heredia, 30 June 1992 leg. Callaghan (CJC);

KEY TO MALES OF *HYPOPHYLLA*

- 1a. Dorsal wing surface with orange areas 2
 1b. Dorsal wing surface blue with no orange areas *argenissa*
- 2a. Orange on hindwing limited to a uniform submarginal
 4 mm wide band 3
 2b. Orange on hindwing wider than 4 mm 4
- 3a. Ventral hindwing post median row of spots between
 Rs and Cu1 in a straight line *zeurippa*
 3b. Ventral hindwing post median row of spots between
 Rs and Cu1 not in a straight line *martia*
- 4a. Fringe on hindwing yellow 5
 4b. Fringe on hindwing brown 6
- 5a. Maculation heavy, tornus forewing always with an
 orange spot *callaghani*
 5b. Maculation reduced, tornus of forewing rarely
 with an orange spot *sudias*
- 6a. Orange-yellow markings on disal area of forewing *idae*
 6b. Orange-yellow markings absent from forewing 7
- 7a. Submarginal black line on forewing thin and
 discontinuous; ventral surface ground color dark gray .. *flora*
 7b. Submarginal black line on forewing wide near apex,
 thinner to tornus; ventral surface ground color light gray .. 8
- 8a. Yellow orange area on hindwing wide, reaching nearly
 halfway from margin to base; black marks between
 forewing veins Cu1 and 1A+2A form continuous line
 with end of cell *caldensis*
 8b. Yellow orange area on hind wing narrower, reaching
 only a third of the distance from margin to base; black
 marks between forewing veins Cu1 and 1A+2A do not
 form continuous line with end of cell *lasthenes*

KEY TO THE FEMALES OF *HYPOPHYLLA*

- 1a. Dorsal forewing band yellow 2
 1b. Dorsal forewing band white *sudias*
- 2a. Dorsal forewing band narrow, not exceeding 4 mm 6
 2b. Dorsal forewing band wide, greater than 4 mm 3
- 3a. Dorsal forewing band more or less constant width 4
 3b. Dorsal forewing band convex distad from costa, ending
 in a point, followed by an irregular, variable patch of
 yellow scaling before distal margin *argenissa*
- 4a. Dorsal forewing band ends opposite distal margin *florus*
 4b. Dorsal forewing band ends opposite tornus and
 inner margin 5
- 5a. Ventral forewing band more extensive, filling cell and
 reaching base; forewing elongated *idaii*
 5b. Ventral forewing band reaches base only along costal
 margin; forewing not elongated *lasthenes*
- 6a. Ventral ground color gray-brown, forewing band
 bordered basad by line at end of cell *zeurippa*
 6b. Ventral ground color gray or white, forewing band not
 bordered basad by line at end of cell 7

- 7a. Ventral hindwing post median row of spots between
 Rs and Cu1 in a straight line *caldensis*
 7b. Ventral hindwing post median row of spots between
 Rs and Cu1 not in a straight line *martia*

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